



Spectral Gamma-Ray Borehole Log Data Report

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Borehole

21-12-07

Log Event A

Borehole Information

Farm : <u>BX</u>	Tank : <u>BX-112</u>	Site Number : <u>299-E33-155</u>
N-Coord : <u>45,569</u>	W-Coord : <u>53,581</u>	TOC Elevation : <u>654.90</u>
Water Level, ft :	Date Drilled : <u>1/31/1972</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

Borehole 21-12-07 was drilled in January 1972 to a depth of 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. Data from the drilling log and Chamness and Merz (1993) were used to provide borehole construction information. Although no information concerning grouting or perforations was available, it is assumed that the borehole was not grouted or perforated since this was not a routine practice during the early 1970s drilling campaign. The top of the casing, which is the zero reference for the SGLS, is about 0.5 ft below the ground surface.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1997</u>	Calibration Reference : <u>GJO-HAN-13</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>07/14/1997</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>99.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>40.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>07/15/1997</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>41.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



Borehole

21-12-07

Log Event A

Analysis Information

Analyst : E. Larsen

Data Processing Reference : MAC-VZCP 1.7.9

Analysis Date : 01/09/1998

Analysis Notes :

This borehole was logged by the SGLS in two log runs. The pre-survey field verification spectra for each logging run met the acceptance criteria established for peak shape and system efficiency; however, one of the post-survey verification spectra failed to meet this criteria. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclide Cs-137 was detected in this borehole. Cs-137 contamination was detected continuously from the ground surface to 3 ft and from 96 ft to the bottom of the logged interval (99 ft). Several small zones of continuous Cs-137 contamination were detected between 6 and 37 ft.

Shape factor analysis was not used to determine the distribution of the Cs-137 contamination because the Cs-137 count rates detected were below the minimum limits required to produce CsSF1 results.

The K-40 concentration values increase gradually from 40 to 42 ft and, although somewhat variable, generally remain elevated to a depth of about 96 ft. The K-40 concentrations increase from 96 ft to the bottom of the logged interval. Relatively increased U-238 concentrations were detected between 40 and 46 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank BX-112.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.